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to allay the irritation caused by parasitic worms, since the two are by no means found together; they are not taken in with food, not merely because they are found in the stomachs of young seals, but in those adults that have fed on squid caught in the open sea. On page 68, Vol. III., 'Report of Fur Seal Investigation,' it says: "It is evident that these things are not swallowed haphazard, but are selected with considerable care from among the articles strewn along the shore, and that a preference is exhibited for rounded objects. This is shown by the fact that, as a rule, only articles of one kind are found in one stomach, although seals do not discriminate between fragments of barnacles and fragments of gastropods. Moreover, pebbles of serpentine and chalcedony are now and then found on the hauling grounds under conditions indicating that they were brought there by the seals, while the pup seen gathering pebbles on Lukanin did so with great care, by no means taking the first that came to hand. The most striking example of this discriminative selection is, perhaps, shown by the pup which had swallowed a buckshot, while the chance of finding such a thing must be, at a guess, about one in a million."

Furthermore, it may be said that as the fur seal regurgitates bones and other indigestible things, the supply of stones must be renewed from time to time.

That there is any connection between the presence of stones and the presence of a gizzard does not follow. F. A. LUCAS.

BROOKLYN INSTITUTE MUSEUM.

ANIMALS AT ROME IN ANCIENT TIMES.

SINCE the publication in SCIENCE (No. 506) of a short article entitled 'Ancient Natural History Lore,' the attention of the writer has been called to an interesting essay on a kindred subject by Countess Cesaresco. It is to be found in the August number (1904) of the *Contemporary Review*, under the title of 'Animals at Rome,' and presents a tolerable conception of the state of natural history amongst Romans of the Augustan age.

A work that was highly popular from the third century onward, and regarded as a stand-

ard authority on zoology, though comparatively little known at the present day is Ælian's treatise on the 'Nature of Animals.' The fifteenth book contains the earliest mention in history of the use of the artificial fly, and gives particulars of other modes of fishing in vogue during the olden time.

C. R. E.

SPECIAL ARTICLES.

ORNITHOLOGICAL NOTES FROM THE NEW YORK ZOOLOGICAL PARK.

A NUMBER of common terns (*Sterna hirundo*), least terns (*Sterna antillarum*), black skimmers (*Rhynchops nigra*) and laughing gulls (*Larus atricilla*) have recently been hatched from eggs in an incubator and reared in the New York Zoological Park. The eggs were all collected on the coast of Virginia.

Some interesting observations have been made for two seasons in connection with these birds, of which certain facts possess a special value and conclusiveness on account of the absolute isolation of these young sea-birds from adults of their species.

The sight of small but entire fish excites a newly-hatched black skimmer much more than does macerated fish, but the reverse is true of the terns until after the first week. Half-boiled and macerated fish does not quite take the place of what the parents of the terns would provide, but fish regurgitated by wood ibises after being held in the crop for two hours is a perfect substitute.

All the birds which were hatched in my experiments refused salt water, for both drinking and bathing, when fresh water was provided.

The remarkable disparity in the length of the upper and lower mandibles of the black skimmer is distinctly foreshadowed in the embryo of about the beginning of the third week.

The call, flock and alarm notes of all four species are wholly instinctive; neither taught by the parents nor learned by imitation. The first class of notes are uttered at the instant when the egg-tooth pierces the shell. The utterance which I have called the *flock* note differs decidedly from the call of the young for food, and is not uttered until the bird is

a day or two old. When several are together, this note seems to attract them to each other, while the ordinary call-note does not, and the alarm note has the very opposite effect.

There is absolutely no *instinctive* fear of man, cats, dogs, hawks or other objects, if these enter quietly into the environment of the birds, but a sudden shadow or unusual noise causes them to utter the characteristic cries of alarm (rarely), or usually to perform certain acts—wholly instinctive—which have for their object an escape from some supposed danger. Under such conditions the terns, which are not so protectively colored as the skimmers, take time to run to a near-by corner or shadow before squatting, while a skimmer crouches instantly, and with two or three side-wise flicks of feet and legs almost buries himself.

The act of pecking is instinctive to a certain extent, but is acquired very slowly and, at first, imperfectly, in this way. By imitation it is learned quickly and is performed successfully within a few minutes.

The art of flying is wholly instinctive, all the species learning the use of their wings as soon as the primaries are large enough to support them.

The characteristic method of feeding, which has given their name to the skimmers, begins to be apparent after three or four weeks, the birds then taking a piece of fish from one's hand with a quick run past, holding the bill so low that it almost touches the ground. A skimmer two months old 'skimmed' often through a small pool of water in its enclosure.

At first the young skimmers are very weak and helpless and are not able to compete with terns of the same age in getting their share of fish, but after about forty days they obtain

the upper hand and soon become so aggressive and domineering that they have to be separated and confined with individuals of their own species.

One interesting result attained is the successful establishing of a colony of laughing gulls in the zoological park. These birds require three years to assume the adult breeding plumage, and for two seasons some twenty-five birds have made their home in the park, without the loss of an individual. Several of their number migrated south in the fall of 1903 and returned the following spring. Thus the wonderful homing instinct of these birds has been controlled and extended by bringing the eggs or the very young birds to a new locality, and though the park individuals doubtless mingled with others of their kind, possibly even associating with their actual parents, yet the *Heim Liebe* overcame all other attractions.

With the erection of the two new bird houses now almost completed, opportunity for experiment and observation upon the collections of the society will be undertaken, on a scale of elaborateness and thoroughness hitherto impossible.

C. WILLIAM BEEBE.

NEW YORK ZOOLOGICAL SOCIETY.

HEIGHT MEASUREMENTS OF THE AFRICAN PYGMIES.

Apropos of the presence of the group of African pygmies from the Wissmann Falls region in the exhibit of the department of anthropology at the World's Fair, it may be pertinent to summarize the height measurements given by various modern travelers who have recorded their observations. Unfortunately, the circumstances under which some of these observations were made were not con-

Observer.	Time.	Place.	No. Adult Males.	Height, Average.
Du Chaillu.....	1863	1° N. 11° E.	1 young man.	4 ft. 6 in.
Schweinfurth.....	1869	1 N. 23 E.	6	4 ft. 10 in.
Wissmann and Wolff.....	1886	5 S. 24 E.	Not given.	4 ft. 7 in.
Stanley.....	1888	1 N. 29 E.	1	4 ft. 6 in.
Johnston.....	about 1900	1 N. 29 E.	Not given.	4 ft. 9 in.
Belgian Officers.....	about 1900	1 N. 29 E.	5	4 ft. 8 in.
Verner.....	1897	6 S. 22 E.	50	4 ft. 8 in.
Verner.....	April, 1904	6 S. 22 E.	15	4 ft. 10 in.
Verner.....	Aug., 1904	St. Louis.	5	4 ft. 10 $\frac{3}{10}$ in.